

# Understanding the Influence of Neuromarketing techniques on assessing genuineness of consumer decision-making process- Literature review

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## Abstract

Asian countries like India represent large untapped markets in Neuromarketing. Hence, there is a need of this approach to conquer the genuineness of customer intention across brands as there are hardly any business practices which examines the genuineness in consumer behavior in developing country like India. This paper is an exploratory study through scholarly contributions of extant Literature indicating neuroimaging techniques as a branch of neuroscience can provide better valuable insights of consumers through unconscious process results in genuinity of consumers preferences and behavior. Finally, study outlines the techniques such as fMRI, EEG and MEG adopted in Neuromarketing and strategies in purchase in consumers' purchase decision-making.

JEL :M31,M37

**Keyword(s):** Neuromarketing, Neuroimaging, Neuroscience, fMRI, EEG, MEG

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Date of Submission: 16-02-2021

Date of Acceptance: 02-03-2021

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## I. Introduction

Neuromarketing is an interdisciplinary field that integrates neuroscience, psychology and and economics (Lee et. al., 2007) which has been coined by Smidts in 2002 (Lewis and Bridger, 2005). It has grown dramatically in last 10 years though its untapped segment in marketing arena as there is lack of knowledge of cognitive neuroscience and ethical issues in adapting neuro imaging as it deals with brain responsible for people behavior (Morin, 2011). Further, It is relatively a new technique and was identified by Nobel Laureate Francis Crick (Harrell,2019) which he called astonishing hypothesis which indicates that the idea that all human feelings,thoughts and consciousness with actions are just the products of neural activity in the brain. Dating back to 2003; the first ever research was done by Professor Read Montague at Baylor College of Medicine and published in Neuron in 2004 studies demonstrate that the study of coke and Pepsi and its potential to create value for marketers. This technique helped marketers to understand the real intent of customers during consumer decision-making process of two different brands though Dr.Montague failed to provide a rationale of brain functioning with choices but revealed that different parts of brain light up irrespective of the awareness of brand they consume. Marketers failed to formulate strategies for hundreds of year incorporating traditional promotion eventually, neuro imaging was the solution to capture the genuineness of customers

This study is an effort to present the facets of Neuromarketing and its benefits to implement innovative forms of analyzing customers and formulate strategies in accordance with consumer genuineness towards brand and product distinctiveness. At the same time challenges faced by marketers in implementation of Neuromarketing strategies in Indian Business System. This technique should be integrated with neuroscience in the area of marketing particularly consumer behavior. Further, the validity of neuro-marketing becomes established, marketers still struggle with existing tools and techniques which are useful though there is complexity in consumers. To address these aspects, marketers need to understand the range of techniques incorporated as part of marketing and future prospects.

### 1.1 NEUROMARKETING -AN OUTLOOK

Only recently scientists have started researching on neuroscience in management arena comprising of new methodologies of consumer neuroscience provide an opportunity to understand the neural level processes in consumers' brain. In this connect, with the advent of Neuromarketing; researchers have more focused on the impact of advertisements on consumers' mind and it was incorporated by agencies such as Neuoco, Neurosense (UK), PHD media in Canada, BrightHouse ( Fischer, Chin and Klitzman,2010) Neurostrategies and

NeuroInsights in USA, SalesBrain in France, Neuro Insight in Australia but in India; it is crucial to understand the consumers genuineness towards the brand and product distinctiveness which is quite difficult through conventional marketing techniques. Therefore, it makes sense to understand the real intent of consumers decision making which is possible through Neuromarketing. The new methodologies of Consumer Neuroscience provide an opportunity to understand the neural level processes in the brains of the consumers which in turn offer valuable insights to marketers in decision making which are otherwise not captured through conventional methods in which marketers adopted new techniques to capture the customers' requirement associated with products but still unable to capture the customer mindset though extensive marketing research has been done for accurate business decision-making. It is found through the study made by Pradeep (2010) that when new product launching process, there use to be 75-percent failure rate. So, they realized the fact that an unconventional approach should be brought into practice<sup>1</sup>. Moreover, market is cluttered with multiple brands and consumers are perplexed in choice making. Hence, it doesn't make sense for marketers to continue with conventional process anymore. India has witnessed this complexity of Consumer decision-making which has led to Neuromarketing technique research wide open to academicians, corporate, researchers and student community to venture upon. So here comes the term 'Neuromarketing' a technique for neuroscience that allows insights into human brain's responses to marketing stimuli (Renvoise and Morin 2007) Organization can wisely invest in Neuromarketing to understand the genuineness of customers perhaps leading to acquire new customers but there should be legal compliance from government for implementation. Besides, the market environment is very complex and poses huge investment in market research for brands as described by Maynes(1985) that market is informationally imperfect as there is extensive price diffusion. Further, he suggests that there is overabundance of brands leading to information overloading. Secondly quality appraisal is difficult for an average consumer. Thirdly the urbanization of society is leading to many stores offering identical products and services. So, marketers realized that the usage of neuro marketing techniques which deals with human brain activity can be better option.

## **II. Review Of Literature**

### **2.1 NEUROMARKETING AS A FIELD OF MARKETING:**

This section presents the Neuromarketing and its contributions in the area of marketing especially in consumer research with different techniques in section 2.2. These techniques basically provides businesses a useful tool for obtaining genuine information about consumers to formulate strategies and attain competitive advantage that lead to a better positioning in the market; this is where the Neuromarketing becomes relevant. For example, it is well known fact that companies focus on well defined market segments and use their resources to tap the expectations of prospect in highly competitive environment. However, marketing executives and advertising so far have based their predictions on intuition, experience and articulated consumer reports to try to predict whether advertising is effective. Neuromarketing in the field of research is based on social psychology ,econometrics and social sciences (Senior & Lee (2008) as Page (2012) describes neuromarketing as the intersection between neuroscience, experimental psychology and expermental economics while Garcia & Saad (2008)and Hubert & Kenning (2008)associate neuromarketing with the sciences of consumer behaviour and cognitive neuroscience.

Bernal(2012) mentions that Neuromarketing helps companies in emotional engagement and memory directly from subconscious brain which in turn saves companies' time and money eventually decreases the risk of a possible product failure. It gives competitive advantage in marketplace as marketers probe the customer's brain in order to gain valuable insights on subconscious processes explaining why advertisement or a brand finally fails or succeed (Morin,2011)eventually, it is value driven approach to detect genuineness of customers decision making in selecting the brand. The power of neuromarketing has the ability to know consumer unconscious response to marketing stimuli without interviewing the individual's own recollection of his conscious experience will lead to insights and predictions about consumer behavior which may have implications to overall business strategy (Burgos-Campero and Vargas-Hernandez, 2013). Eventually, neuromarketing directly measures observable brain behavior, thus eliminating subjectivity and ambiguity found in traditional marketing research such as focus groups and interviews. By doing so companies that rely on neuromarketing can produce more appropriate products that the consumer is likely to want and therefore will apparently increase their profitability by creating marketing campaign that work as suggested by Oliver (2016) that brain activity is universal as it implies globally I.e., any research in one market or country can be applied in another market or country as brain functioning is same in every human being though human cultures, education levels and religions may be different. Hence, accessing the universal language inside the human brain inevitability gives neuro- marketing a competitive advantage in the market. In similar lines; vashishta and Balaji(2012) analyzed that neuromarketing helps in developing a more effective method for triggering human emotions in decision making. Kahheman (2011) and Bridger (2015) have opinion that bias and heuristics are evident in traditional marketing research whereas in Neuromarketing confirmation bias and hindsight bias is

well understood by brain as noted by Halvorson and Rock (2015) and further, neuromarketing studies have found that advertisement have greater impact on customers and precisely speaking peoples brain respond to brand related advertising messages by scientifically monitoring brain wave activity, eye tracking and skin etc., to create a better product to attract customers. It is evident from the study made by Daugherty T and Hoffman (2017) that Marketing professionals and researchers have embraced neuromarketing based on the genuineness and right investment with giving emphasize on subjective research like focus and survey.

Finally, economists, investors, CEO's, researchers have not come forward or taken initiative which may influence the economy though neuromarketing has emerged as ally of marketing (Rodrigues, 2011)

## **2.2 NEUROMARKETING TECHNIQUES:**

To understand the genuineness of customers, conventional approach is unable to get clear picture of consumer decision making ; models exist though. In this line, neuromarketing techniques came into being to measure the physiological and neural signals to gain insights into customer's preferences and decision making as marketers with their Brand focus have implemented neuromarketing techniques in foreign nations and found great impact in marketing campaigns as they are able to assess cognitive response of consumers in terms of intent to purchase the products associated with brands which is huge challenge to attract the market segment; eventually, increase in purchase (Samuel and Prasanth, 2012). In this line, consumer neuroscientists have discovered tools for this venture in terms of recording metabolic activities happening in human body and neural activities of consumers brain. Krajnović et al, 2012 have researched the influence of marketing instruments on customers emotion by means of sensory elements such as colour, design, music, scent and taste on consumer's perception which results in purchase. The study by Glaenger, E. (2016) indicates that Neuroscience is applied to consumer research with neuroimaging tools which has unbiased view to understand the consumer genuinely.

Usually, neurological tests have to be conducted to consumers willing to participate. In this context, Pradeep, 2010 has indicated that Neuroscientific methodologies provide insight through neuroimaging, brain areas and subconscious processes without conscious effort of the participants.

Enlisted below outlines the methods to measure physiological response in non-invasive fashion.

**1. Electroencephalography (EEG)-** This passive technology incorporate sensors to pick up electrical signals based on activation of brain waves (Pradeep, 2010) It uses a cap with electrodes that are placed on head of each participant of the study to measure low voltage signals. When a stimulus is presented to a subject, such as a television commercial, neurons produce a small electrical current that can be amplified. This electric power has multiple frequency patterns called brain waves which are associated with different states of consciousness. Further, Morin, 2011 indicates that brain waves can be recorded in small interval of time and record up to 10,000 times per second in which information is acquired through the senses and speed of thoughts. It is estimated that 80-percent of our brain activity is used to maintain a state of rest so it cannot be assumed that brain waves generated are entirely produced by a stimulus. The study made by Pereya, 2011 states further that EEG is the best instrument to evaluate the brain wave handling cognitive information alongside subject information about neural mechanism. In fact Electroencephalography (EEG) measures the electrical pulses created when a neuron fires as there are billions of neurons in the brain, their activity combines to produce electrical potentials so large that the activity can be detected at the surface of the skull. It fits like a cap of electrodes around the head and is therefore far more portable and inexpensive than an fMRI but the only real disadvantage is that it produces less structurally accurate information compared to the fMRI machine and makes it a meager substitute for many tests done with an fMRI . Perhaps, this information can be retrieved for the purpose of collating the genuine information and store in depository. Studies carried out by Reeves Lang, Forson and Rothschild in the year 1990's talks about this experiment a lot which is based on scientific experiments. Studies are currently underway to make the EEG a more effective tool in neuromarketing (Telpaz, Webb, and Levy, 2015)

**2. Functional magnetic resonance imaging (fMRI) -** It is a tool that uses an MRI Scanner to observe image changes in blood flow. Experiments were conducted in which neurons need to use energy, which is carried by the bloodstream and rapidly metabolized. During this experiment, dependent level of oxygenated blood was tested eventually, some brain areas of the subject received more oxygenated blood than the previous trial. (Morin, 2011). In fMRI studies ; the change in the BOLD signal is an accurate measure of neural activity with a spatial resolution ten times better than EEG. (Pradeep, 2020, 13) During this process, brain mapping is done to discover which area of brain is most affect when purchasing by consumers which gives clear indication for marketers to stimulate consumers through right promotional content. However, few major disadvantage are noticed in fMRI machine which scan the brand, the consumer must be lying inside the machine in the hospital which is not conducive to eliciting the same reason as watching TV Advertisement on couch or in retail stores. Another disadvantage is that a scanner costs approximately \$1 million with annual cost of \$100,000-\$3,00,000 (Ariely and Berns, 2010) making it difficult for small company to apply in consumer research.

3. **Magneto encephalography (MEG)** - This tool uses magnetic potential at the scalp to record the magnetic fields of brain activity. It is a function of electrochemical signals between neurons. These neural activities create magnetic fields that can be amplified and mapped using MEG which is better than EEG as far as spatial resolution is concerned. The limitation observed by Morin (2011) is that MEG is not good method to observe sub cortical areas as best recorded brain activity of the cortex. This suggests that the best way is to use MEG to measure activity in known areas or which are expected to be produced in a specific task, rather than used for exploratory experiments.

Most marketers should hunt for specialized equipment and skills required which are beyond their reach and find suppliers for them. The various distinctive features of the techniques is outlined as presented in Appendix 1, Table 1

### **III. Objectives Of The Study**

The present study is being exploratory in nature is taken up to address Neuromarketing and its implications. Based on this, specific objectives are enlisted below

- To outline the importance of Neuromarketing techniques in understanding customers' genuineness during purchase using neuro imaging
- To study the strategies of neuro-branding affecting purchase decisions of customers

### **IV. Methodology**

Neuromarketing is fairly new phenomenon in Indian context and great interest to researchers (Morin, 2011, Dinu and Tannase, 2010). Primarily the study is exploratory in nature addressing the constant development of Neuromarketing by reviewing extant literature in Indian context very little exist though to disseminate the business strategies associated with Indian Business System. Further, this technique is quite complex as it is linked with brain cells and associated human organs. Besides, the regulations set by Government of India applicable for adopting Neuromarketing strategy for individual and group.

### **V. Discussions:**

Revisiting Objective 1; Extant literature presented addresses the significance of neuro marketing and its technique which in turn extends to objective 2 as presented in section 4.1 given below

#### **5.1 STRATEGIES OF NEUROBRANDING AFFECTING CUSTOMERS' PURCHASE DECISION MAKING**

Going back to consumer behavior basics; neuro marketing works as an interface that give access to human emotions though the brain is a black box (Fugate,2007;Marci,2008; Green and Holbert,2012). In neuroscience, it is evident that emotional part of brain influences the rational part (Hazeldine,2013) Moreover, modern psychology helped to figure out that people very often say one thing and do completely different thing (Couson and Vayssettes,2013).Most of the studies reveals that in recent times marketers realized that the need to sync neuroscience with marketing and make their strategies get right for the only purpose of knowing genuineness of customers through Brain Activation for untapped market (Pradeep,2010). Apparently, neuro scientific methods can provide information on trust development which is determining factor for marketer and consumer as there is risk of opportunistic behavior (Motterlini(2008)) Further, he goes on to say that trust is over and above behavior of rational economic computation. Undoubtedly obtaining information from the neuro-marketing is more accurate because it takes into account not only the sociological and psychological profiles of customers, but also the cognitive aspects. Therefore, neuroscience gives us the ability to explore more of each group and segment the market on more solid bases (Braidot, 2005, pp.217). Studies using neuro-imaging methodologies provide insight into real-time consumer response to a specific stimulus. The Brand identity can create emotions than the product or brand itself eventually, people get connected to the brand (Dragolea et al., 2011). Neuromarketing provides a real competitive edge in an high increased saturated market and enterprises should advise employees to acquire skills and resources (Pradeep, 2010, 5). The studies done in foreign countries differ as cultural aspects differ in particular with consumer behavior. Perhaps, neuromarketing has a significant effect on resolving organization's problem and decisions to understand consumers better more precisely accurate (Lee, et al., 2010). Besides, the studies show that there is influence of psychology of pricing on consumers which is evident across retail stores in which mistakes made by consumers when they process terminated prices 0.99 compared with integers and suggest that individual pays less attention to last sequence numbers (Lee et al,2007) Apart from that, the price of commodity like detergent and expensive products like Refrigerator shows that brain activation involves different processing with different products and associated

brands in coherence with celebrity endorsements in advertising which helps marketers save costs in terms of all associated marketing campaigns with suitable models who can make right appeal to audience or customers. Hence, neurosciences in conjunction with marketing provides new ways to observe, analyze consumer decision-making which helps in competitive positioning in the market and stay relevant in market as intent of neuromarketing is to identify customers needs scientifically inquiring the cognitive and perceptual features to satisfy their requirements (Braidot, 2005, 210) though legal restrictions and government regulations comes in the way.

Neuromarketing in this paper clearly indicates that it unveils the real intent of customers preference and buying products/ services with tools mentioned in section 2.2 may replace the existing conventional marketing with intention of increased leads and Return on Investment (Van Langendonck, 2015). Moreover, it is meant for creating better product to entice the customer but not to manipulate consumers' mind (Glaenzer, 2016) and seeks information beyond traditional techniques which adds value to business (Plassmann et al, 2015) though it is difficult to implement Neuromarketing commercially as well as neuroimaging technology along with investment in country like India as regulations should be set by Government and Enterprises for commercial purpose

## **VI. Conclusion**

This study is an effort which has addressed the neuromarketing and its techniques by meta analysis of extant literature and placed before the academic and corporate fraternity, student community to explore into Neuromarketing which is prevailing across industries but limited in India because of lack of awareness among the stakeholders and customers as well though there is technological advancement across business verticals.

This study shows that extant literature that Neuromarketing is contemporary and holistic approach especially in retail store really understand the genuineness in terms of product choice, great ambience and pleasure in shopping (Levy and Weitz, 2009). Neuroscience research and findings about the metabolic activities and subconscious mechanisms of human mind especially in advertising has brought paradigm shift in marketing arena towards the neuroscientific perspective (Shaw and Jones, 2009) as against traditional research such as customer surveys, interviews and questionnaires alone were not reliable sources of research data (Zara and Tuta, 2013)

One should understand the significance of different dimensions of Neuromarketing in conjunction with medical and business though it is most difficult part is implementation as it requires Government permission as it deals with human organs to identify consumers' genuineness which is crux of neuro marketing for making profits commercially. Moreover, this elevate the business process though certain complex issues come in the way as it deals with neuroscience. To conclude there is a collaborative effort done between marketing and neuroscience.

In Business sense; Neuromarketing is a measuring preferences of customers rather than manipulating as this provides genuine information to consumers' subconscious brain something that even consumer himself is not actually aware of and neuromarketing has been increasing criticized for accessing sensitive information from consumers subconscious. In this line, neuromarketing should be deployed cautiously with government regulations and make it optional for customers and marketers cannot expect every customers go for it as it deals with privacy or personal taste to be known to others which is quite natural. But, there is a boost in retail business across India and identify the right segment for generating profit

## **VII. Limitations And Future Research**

This Study resort to distinctive features of Neuromarketing and techniques in analyzing genuineness of customers' in broader perspective pertaining to B2C model I.e., Retail business and advertising which is comparatively new phenomenon though it is prevailing in the market. Further research can be taken in Retail store operations and to be specific in visual merchandising and in store displays as well. Also pricing strategies across brands and so on and so forth. Lastly, to find out various challenges faced by marketers in formulating neuro-branding strategies.

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**APPENDIX 1**  
**Table 1 Tools used in Neuromarketing**

Description	fMRI	EEG	Eye tracking		Biometrics	Facial Coding
			Gaze	Pupilometry		
<b>Functionality</b>	Detects blood flow in brain associated with neural activity	records electrical signals on the scalp from neurons inside the brain	detects exactly where subjects direct their gaze	Measures whether subjects' pupils are dilated	measures skin conductance, heart rate and respiration	identifies facial expression
<b>Application in Marketing practices</b>	Helps in setting pricing which Improves branding	improve advertising and branding	improve website design, advertising and packaging		Improve Advertising content	
<b>Unearth about consumers</b>	Detailed emotional responses Level of engagement Recall brand	level of engagement recall	what grabs their attention what confuses them speed of recognition		level of engagement whether their response is positive or negative	general emotional response: happiness, surprise, fear and so on
<b>Pros and Cons</b>	most expensive and invasive method less detailed than EEG but considered the best standard for measuring specific emotions must be performed in a laboratory	more expensive and invasive than many other methods not as precise as fMRI, but can measure changes over smaller increments of time	relatively inexpensive and easy to administer best used in conjunction with biometrics does not measure emotions		best used in conjunction with other methods, such as eye tracking	relatively inexpensive

Source: Harvard Business Review (<https://hbr.org/2019/01/neuromarketing-what-you-need-to-know>)  
(Compiled by Researcher)

Hemantha Y Ph.D. "Understanding the Influence of Neuromarketing techniques on assessing genuineness of consumer decision-making process- Literature review." *IOSR Journal of Business and Management (IOSR-JBM)*, 23(02), 2021, pp. 23-29.